

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)	
)	
Expanding Flexible Use of the 3.7 to 4.2 GHz Band)	GN Docket No. 18-122
)	
)	
Petition for Rulemaking to Amend and Modernize Parts 25 and 101 of the Commission's Rules to Authorize and Facilitate the Deployment of Licensed Point-to-Multipoint Fixed Wireless Broadband Service in the 3.7-4.2 GHz Band)	RM-11791
)	
)	
Fixed Wireless Communications Coalition, Inc., Request for Modified Coordination Procedures in Bands Shared Between the Fixed Service and the Fixed Satellite Service)	RM-11778
)	

REPLY COMMENTS OF INMARSAT

Inmarsat Inc., on behalf of itself and its affiliates ISAT US Inc., Inmarsat Solutions (US) Inc., and Inmarsat plc (collectively "Inmarsat"), submits these reply comments in response to the comments submitted by the Satellite Industry Association ("SIA")¹ in response to the May 3, 2019 public notice ("Notice")² seeking certain additional input in the above-captioned proceedings. In the Notice, the Commission requests input focusing on the relative interference protection rights of satellite operators and earth station operators, and whether the Commission

¹ Comments of the Satellite Industry Association, GN Docket No. 18-122 (filed July 3, 2019) ("SIA Comments")

² See *International Bureau and Wireless Telecommunications Bureau Seek Focused Additional Comment in 3.7-4.2 GHz Band Proceeding*, Public Notice, GN Docket Nos. 18-122 *et al.* (rel. May 3, 2019).

has authority to modify FSS operators' authorizations and earth station operators' registrations,³ and whether the Commission has authority to conduct a C-band incentive auction.⁴

Inmarsat concurs with SIA's observation that "space station operators possess enforceable rights to transmit, and [the] right of an earth station to receive a satellite communication is derivative of the right held by the space station operator."⁵ Inmarsat files these comments to highlight that these rights extend to satellite tracking, telemetry, and command ("TT&C") operations in the 3.7-4.2 GHz frequency band, including protection in perpetuity of frequencies used for emergency TT&C beacon transmissions. Inmarsat reiterates its position that any approach for introducing new flexible use in the 3.7-4.2 GHz band must protect satellite TT&C operations in perpetuity.

The Commission sought comment in Notice of Proposed Rulemaking initiating this proceeding⁶ about how it should treat TT&C operations.⁷ The Commission notes that several systems have TT&C operations in this band, and further, the Commission correctly recognizes that TT&C frequencies are a function of satellite design that cannot be changed after launch, and therefore TT&C operations will need protection throughout the life of the spacecraft.⁸

Inmarsat agrees with the Commission's assessment that TT&C operations must be protected. This protection should be provided for all currently operational (and applied-for)

³ See 47 U.S.C. § 316.

⁴ See Notice at 1-7.

⁵ SIA Comments at 3.

⁶ Expanding Flexible Use of the 3.7 to 4.2 GHz Band, GN Docket No. 18-122, *Notice of Proposed Rulemaking*, FCC 18-91 (rel. July 13, 2018) ("Mid-Band NPRM").

⁷ Mid-Band NPRM at ¶ 180.

⁸ *Id.*

systems. Additionally, as explained below, Inmarsat proposes that the Commission provide protection for current and future use of emergency TT&C operations in the 4198-4200 MHz frequency range.

Inmarsat uses spectrum in the 3.7-4.2 GHz frequency range for TT&C operations in two ways across its satellite fleet.⁹ Inmarsat conducts TT&C operations in the space-to-earth direction for its Inmarsat-3 and Inmarsat-4 satellites, including its Alphasat satellite, in the 3945-3955 MHz frequency range. In the United States, these operations are conducted at Inmarsat's earth station in Hawaii.¹⁰ These are receive-only operations, with the transmitters located on the spacecraft already in orbit, and therefore no adjustments can be made to the frequency or signal. Inmarsat will continue to need to use these frequencies in this location for the rest of the operational life of the Inmarsat-3 and Inmarsat-4 satellites, which is likely to extend to 2030 or beyond.

Inmarsat also uses frequencies in the 4198-4200 MHz range for emergency TT&C operations on its Inmarsat-5 satellites on a global basis. Inmarsat has previously informed the Commission of the existence of these TT&C operations, although it did not seek a license to serve the United States in these frequencies.¹¹ These frequencies are employed by beacons on the Inmarsat-5 spacecraft that are used during transfer orbit, satellite relocation activities, end-of-

⁹ These uses were timely disclosed by Inmarsat in response to the information collection requirements of the 2018 Order regarding expansion of flexible use of the 3.7-4.2 GHz band. *See* Inmarsat, Submission of Information on Earth Station and Satellite Use of the 3.7-4.2 GHz Band, IBFS File Nos. SES-MFS-20141003-00786, SES-RWL-20171205-01307, SES-LIC-20070416-00479, SES-AMD-20070920-01300, SES-MFS-20080228-00207, SES-AFS-20080410-00448, SES-LIC-20120426-00397, SAT-PPL-20141003-00106, SES-LIC-20150402-00188 & SAT-PPL-20160111-00001 (filed May 28, 2019).

¹⁰ *See* FCC Radio Station Authorization, Call Sign E080059.

¹¹ *See* IBFS File No. SES-LIC-20120426-00397, Attachment A at 5; *id.*, INMARSAT-5 F2 Schedule S Tech Report at 24; IBFS File No. SES-LIC-20150402-00188, Exhibit A at 4; *id.*, INMARSAT-5 F3 Schedule S Tech Report at 24.

life operations, and in case of an emergency. Inmarsat's gateway earth station in Hawaii has the capability to receive transmissions from these emergency beacons, as do Inmarsat's other C-band TT&C earth stations around the world.

Inmarsat plans to use these same frequencies on future generations of satellites. Indeed, these same TT&C frequencies are integral to the design of the Inmarsat-6 satellites, the first of which is scheduled for launch in 2020. Because of the emergency nature of this use, and the corresponding need for high reliability, these operations cannot be conducted as effectively at a higher frequency band. C-band spectrum has more attractive propagation characteristics for these emergency TT&C operations as compared to operations in higher frequency bands, improving reliability through greater resiliency to rain fade and other environmental factors. Additionally, higher frequency transmissions have a narrower beamwidth, that, while acceptable for normal operations, create additional challenges with establishing and sustaining communications during non-nominal situations—precisely the circumstances when emergency TT&C operations are brought into use. Finally, using the same frequencies for future emergency TT&C operations is a matter of efficiency and improved safety, as it will permit the spacecraft operator to take advantage of the availability of established TT&C sites around the world during transfer orbit, satellite relocation activities, end-of-life operations and emergencies.

The TT&C transmissions from a space station are entitled to protection and interference-free reception for the reasons stated in the SIA comments. Because of the critical nature of emergency TT&C operations, including telemetry and beacon transmissions from space stations, Inmarsat respectfully requests that the 4198-4200 MHz band be protected as a home for emergency TT&C operations across the country in perpetuity. Even if the Commission chooses to prevent other future new space-to-earth operations in the 3.7-4.2 GHz band, this two-

megahertz range at the very top of the frequency band should be protected for emergency TT&C operations at existing and future earth stations.

As the Commission explores creative approaches to spectrum use and regulation, it should recognize the key role of satellite communications today and in the future 5G ecosystem. As the Commission has recognized, TT&C operations are critical to satellite system performance, and this criticality justifies protection of satellite TT&C operations in the 3.7-4.2 GHz band in perpetuity.

Respectfully submitted

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